

Table S1. Catalytic constants of the investigated enzyme/substrate combinations. Values of IMP-1 and *OH-0* are taken from Oelschlaeger *et al.* (2005) *Protein Sci* 14, 765-774. For *OH-2* and *OH-X*, substrate inhibition was observed, and, as in Simm *et al.* (2001) *FEBS Lett* 509, 350-354, the apparent productive binding constant K_{app} was used rather than K_M . The inhibition constants were $155 \pm 50 \mu\text{M}$ for *OH-2/NIT* and $70 \pm 8 \mu\text{M}$ for *OH-X/NIT*.

Substrate	Kinetic constant	Enzyme			
		IMP-1	<i>OH-2</i>	<i>OH-X</i>	<i>OH-0</i>
NIT	k_{cat} (s^{-1})	229 ± 11	205 ± 19	439 ± 24	233 ± 11
	$K_{M/app}$ (μM^{-1})	9.7 ± 0.8	1.9 ± 0.4	10.8 ± 2.0	10.7 ± 1.8
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	23.8 ± 1.0	108 ± 13	41.4 ± 7.2	22.2 ± 2.8
CEF	k_{cat} (s^{-1})	64.5 ± 5.7	41.5 ± 0.5	41.0 ± 1.7	45.7 ± 1.0
	K_M (μM^{-1})	7.4 ± 1.3	1.2 ± 0.2	2.6 ± 0.4	5.2 ± 0.5
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	8.8 ± 0.7	35.0 ± 4.3	15.7 ± 1.5	8.9 ± 0.8
CTX	k_{cat} (s^{-1})	19.0 ± 4.1	7.8 ± 0.2	18.2 ± 0.2	24.4 ± 2.6
	K_M (μM^{-1})	6.9 ± 3.1	1.3 ± 0.3	3.2 ± 0.3	7.6 ± 1.1
	K_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	2.9 ± 0.6	6.0 ± 1.5	5.8 ± 0.4	3.2 ± 0.2
PEN	k_{cat} (s^{-1})	713 ± 3	920 ± 102	576 ± 37	1060 ± 130
	K_M (μM^{-1})	445 ± 16	255 ± 61	357 ± 40	1230 ± 190
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	1.6 ± 0.06	3.7 ± 0.5	1.62 ± 0.08	0.87 ± 0.05
AMP	k_{cat} (s^{-1})	154 ± 18	74 ± 3	93 ± 6	80 ± 9
	K_M (μM^{-1})	223 ± 44	60.5 ± 0.3	140 ± 16	157 ± 26
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	0.70 ± 0.07	1.22 ± 0.44	0.66 ± 0.04	0.52 ± 0.08
IMP	k_{cat} (s^{-1})	77 ± 4	56 ± 5	35.7 ± 0.6	43.8 ± 2.7
	K_M (μM^{-1})	25 ± 2	12.8 ± 3.0	21.7 ± 1.2	22.7 ± 3.1
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	3.1 ± 0.1	4.5 ± 0.7	1.65 ± 0.08	1.95 ± 0.17
CAZ	k_{cat} (s^{-1})	12.2 ± 2.0	8.4 ± 0.5	8.6 ± 1.4	19.7 ± 2.7
	K_M (μM^{-1})	44 ± 13	13.7 ± 1.1	40 ± 11	95 ± 17
	k_{cat}/K_M ($\text{s}^{-1} \mu\text{M}^{-1}$)	0.28 ± 0.04	0.62 ± 0.03	0.22 ± 0.02	0.21 ± 0.01